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RESEARCH ARTICLE

The technique of sutureless total abdominal hysterectomy in gynaecological malignancies: our experience

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ABSTRACT

Background: Abdominal hysterectomy is an important part of gynaecological malignancy surgeries. These patients usually have associated comorbidities. Prolonged operating times and post operative complications leave them vulnerable for increased morbidity, mortality and financial burden. By using sealing device for hysterectomy, we have tried to reduce the operating time, blood loss and hospital stays. **Objectives:** To analyze the outcome of using vessel sealer for doing sutureless hysterectomy in gynaecological malignancies. **Methodology:** A total of 29 patients satisfying inclusion criteria were included. They underwent appropriate surgery according to the type of malignancy and stage. We calculated duration of surgery, blood loss and hospital stay. Post operative complications and blood transfusions were recorded. We compared our study technique with others conventional suture ligation technique. **Results**: The mean operating time for TAH with BSO; TAH, BSO with pelvic lymph node dissection (PLND); TAH, BSO, PLND with total omentectomy was 53.33±9.42, 120, 113.125±31.169 min respectively. The mean blood loss was 26.66±4.71, 100, 60±28.5 ml. Mean hospital stay was 4.66±0.94, 6, 7.125±1.9 days respectively. Post operative complications included retention of urine, lymphedema, lymphocele with deep vein thrombosis in one patient each. No mortality was seen. No blood transfusions were required in any patient. **Conclusion**: Sutureless hysterectomy using vessel sealing device is a good technique to reduce the intraoperative and postoperative morbidity in gynaecological malignancy surgeries. Major advantages being decreased blood loss and duration of surgery.

Keywords: Suture less hysterectomy, gynecological malignancies, radical hysterectomy, sealing device, vessel sealer assisted radical hysterectomy.

In cases of gynaecological malignancies TAH with pelvic lymph node dissection is an integral part of staging laparotomy in ovarian[1] and endometrial cancers. Radical hysterectomy is done in cervical cancer and endometrial cancer stage 2 patients [2, 3]. Patients with gynaecological malignancies undergo staging or debulking surgeries which usually takes long operating time. This not only increases blood loss but increases chances of venous thromboembolism and more intraoperative and peri-operative complications. We at SRCC did TAH/radical hysterectomy sutureless technique with sealing device and determined surgical time, blood loss, hospital stay and its morbidity and mortality.

The objective of the study was to assess the outcome of sutureless total abdominal hysterectomy in gynaecological malignancy cases performed with sealing device and to compare it with other studies of conventional TAH with suture ligation technique.

Materials and methods

It is a retrospective observational study carried out in the department of surgical oncology at SRCC, over a period of 2 years after taking approval from ethical committee. The total number of patients included were 48.

The vessel sealing system can be used for vessels up to and including 07 mm in diameter, lymphatics[5] and tissue bundles. This system provides precise energy delivery and

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electrode pressure to vessels for a controlled time period to achieve a complete and permanent tissue fusion. It has been optimized to produce minimal sticking, charring and lateral thermal spread to adjacent normal tissue thereby decreasing chances of damage to adjacent structures.

Inclusion criterias -

Patients with ovarian malignancy.

Patients with endometrial carcinoma.

Patients with carcinoma cervix early stages.

Patients with adnexal mass.

Exclusion criterias -

Patients with vaginal / vulvar malignancy.

Patients with bleeding disorder.

Patients with metastasis (ovarian malignancies IV B were excluded)

Patients diagnosed with endometrial, ovarian or cervical malignancy or a suspected adnexal mass were prepared for surgery as per standard protocols. The complete workup was done which includes blood biochemistry and appropriate radiological studies like CT, MRI or PET scan. Tumor markers and other relevant investigations according to co morbidities were done. Patient was optimized for surgery. Surgical staging was done. Ascitic fluid or normal saline wash was sent for cytology in carcinoma ovary, endometrium and adnexal mass. The basic procedure done was total abdominal hysterectomy with bilateral aalpingo-oophorectomy with bilateral pelvic lymphadenectomy. Lymph nodal sampling was done in cases where para-aortic lymph nodes were enlarged. Total omentectomy was done in ovarian carcinoma while biopsy was taken in endometrial carcinoma cases as per standard protocol. For cervical cancer, radical hysterectomy was done appropriate to the clinical stage as classified in Querlow Morrow classification [6].

Abdominal drain was routinely put in all cases. Abdominal closure was done by closing peritoneum and rectus sheath with PDS loop. Subcutaneous drain was inserted and subcutaneous space closed with monocryl 3-0. Skin closure was done with skin stapler.

Sutureless hysterectomy was done with vessel sealing device. There was no ligation of any of the ligaments with sutures. Uterus held with Kocher's forceps at the cornu. Bilateral round ligaments were coagulated and cut. Ureters identified before coagulating and cutting infundibulopelvic ligaments bilaterally. Anterior layer of broad ligament cut and continued medially to separate the bladder from cervix. We prefer to dissect the uterine artery at the origin in pararectal fossa and clip or coagulate it. Bladder pushed down till the upper vagina is reached. Posterior peritoneum at the apex of bilateral uterosacral ligament cut and pushed down. Serial coagulation and cutting of lateral parametrium is done till vagina is reached. Extent of parametrium dissection was done according to type of hysterectomy planned. Vault opened with monopolar cautery and sutured with continuous interlocking vicryl 2- 0 sutures.

Blood loss was estimated by difference in weight of dry gauze and wet gauze. Difference in their weight (in grams) was equal to blood loss in milliliters. Blood volume in the suction was measured with spectroscope. Fist size clot was considered equivalent to 500ml of blood.

Procedure time was recorded as skin incision to closure of abdomen. Complications during surgery and in post operative period were recorded as early (7days), intermediate (28 days) and late (3 months). Length of hospital stay was noted.

Results

Table 1 shows the total number of patients being 48 with their diagnosis. 47.9% were ovarian cancer cases while 33.33 % were endometrial carcinomas. 10.4% were benign adnexal masses whereas 4.16% were benign uterine masses. 1 case was borderline ovarian tumor and carcinoma cervix each.

Table 1: Showing total number of patients with their diagnosis

Diagnosis	No of patients	Percentage
Ovarian cancer	23	47.91
Borderline ovarian mass	1	2.08
Benign adnexal mass	5	10.41
Benign uterine mass	2	4.16
Endometrial cancer	16	33.33
Cervical cancer	1	2.08
Total	48	100

Table 2 shows about the extent of procedure alongwith sutureless hysterectomy patients. Mean operating time (MOT), mean blood loss (MBL) and mean hospital stay (MHS) was calculated for these categories. TAH, BSO was done in 3 cases with a MOT of 53.33 min, MBL of 26.66 ml and MHS of 4.6 days. TAH, BSO and B/L PLND was done in 1 case with MOT of 120 min, MBL of 100 ml, MHS of 6 days. TAH, BSO, B/L PLND and omental biopsy was done in 6 cases with MOT of 133.3 min, MBL of 76.6 min and MHS of 6.8 days. TAH, BSO, B/L PLND, PALND and omental biopsy was done in 2 cases with MOT of 112.5 min, MBL of 50ml and MHS of 8.5 days. TAH, BSO, B/L PLND and total omentectomy was done in 16 cases (15 of ovarian cancer and one case of endometrial cancer where infracolic omentectomy was done) with MOT of 113.125 min, MBL 60 ml and MHS of 7.125 days. TAH, BSO, B/L PLND, PALND

and total omentectomy was done in 1 case with MOT of 135 min, MBL of 50 min and MHS of 5 days.

Table 2: Showing various procedures and their mean operating time, mean blood loss and mean hospital stay

Procedure done	No of cases	Mean operating time (minutes)	Blood loss (ml)	Mean hospital stay (days)
TAH+ BSO	3	53.33±9.42	26.66±4.71	4.66±0.94
TAH+ BSO + B/L PLND	1	120	100	6
TAH+BSO+B/L PLND + Omental biopsy	6	133.33±36.93	76.66±37.26	6.83±1.57
TAH+BSO+B/L PLND+ PALND + Omental biopsy	2	112.5±22.5	50	8.5±0.5
TAH + BSO + B/L PLND + Total omentectomy	16	113.125±31.169	60±28.5	7.125±1.9
TAH+BSO+B/L PLND+PALND+Total omentectomy	1	135	50	5

TAH – Total abdominal hysterectomy; BSO – Bilateral salpingo-oopherectomy; B/L – Bilateral; PLND – Pelvic lymph node dissection; PALND – Para-aortic lymph node dissection.

Table 3 is of comorbid conditions showing diabetes in 24.13 % of patients and hypertension in 27.8%. Hypothyroidism was in 20.6% of patients. Obesity was found in 6.89%. 8 patients (27.58%) had 2 or more comorbidities.

Table 3: Showing number of patients with comorbidities

Comorbidities	No of patients	Percentage
Diabetes	7	24.13
Hypertension	8	27.58
Obesity	2	6.89
Asthma	1	3.44
Hypothyroidism	6	20.6

Table 4 is of perioperative complications. No intraoperative complication was there. Early post operative retention of urine was seen in one patient of type C radical hysterectomy which resolved in 3 months. Left iliac fossa lymphocele was seen in 2 patients (6.89%). One patient had left leg DVT (Deep vein thrombosis) with hydroureteronephrosis. None of our patients had margin positivity at parametrium and vaginal cut edge. No fistulae formation was seen.

Table 4: Showing number of patients with complication during intraoperative and postoperative period.

Complications	No. of patients
Intraoperative	Nil
Early	1
Intermediate	2
Late	3

Discussion

Satoru Kyo et al[7] did a study on "Experience and efficacy of a bipolar vessel sealing system for radical abdominal hysterectomy (RAH)" in 2009. They included 85 patients who had RAH with pelvic lymphadenectomy for cervical cancer or endometrial cancer. In 67 patients, clamps with suture ligation of pedicles was done and in 18 patients ligasure was used to tie the vascular pedicles. In our study we did radical hysterectomy or total abdominal hysterectomy. We calculated mean operating time, mean blood loss and mean hospital stay. The categories included total abdominal hysterectomy alongwith various other procedures like pelvic or para-aortic lymphadenectomy, omental biopsy or omentectomy. In their study, patients of ligasure group had reduced operation time (mean, ligagure 242.8 ± 36.1 minutes vs conventional, 349.1 ± 82.6) minutes; $P < 0.001$) and decreased blood loss (mean, 583.1 ± 287.6 mL vs 999.0 ± 524.2 mL; $P < 0.005$). In our data we stratified patients according to the type of procedure required alongwith hysterectomy. We did TAH with BSO in 3 cases with a MOT of 53.33 min, MBL of 26.66 ml and MHS of 4.6 days. TAH, BSO, B/L PLND was done in 1 case with MOT of 120 min, MBL of 100 ml, MHS of 6 days. TAH, BSO, B/L PLND and omental biopsy was done in 6 cases with MOT of 133.3 min, MBL of 76.6 min and MHS of 6.8 days. TAH, BSO, B/L PLND, PALND and omental biopsy was done in 2 cases with MOT of 112.5 min, MBL of 50ml and MHS of 8.5 days. TAH, BSO, B/L PLND and omentectomy was done in 16 cases (15 of ovarian ca and one case of endometrial ca where infracolic omentectomy was done) with MOT of 113.125 min, MBL 60 ml and MHS of 7.125 days. TAH, BSO, B/L PLND, PALND and omentectomy was done in 1 case with MOT of 135 min, MBL of 50 min and MHS of 5 days. In their study, blood transfusion was required in 1 patient in ligasure group and 27 (40.2%) amongst conventional suture group. We did not transfuse blood to any of our patients. They found postoperative hemoglobin levels reduction to belower in the ligasure group than in conventional group (mean, 2.31 ± 2.22 mg/dL vs 3.22 ± 1.11 mg/dL; $P < 0.05$). They concluded that the ligasure vessel sealing system reduce blood loss and operating time in radical abdominal hysterectomy. Their conventional group had higher operating times and more blood loss than our study.

In a study done by Karl Tamussino et al[8] in 2005 "Electrosurgical bipolar vessel sealing for radical abdominal hysterectomy", they analyzed the use of an electrosurgical bipolar vessel sealing system for radical abdominal hysterectomy. Their study included 52 patients with stage IB1–IIB cervical cancers and performed radical abdominal hysterectomy with systematic pelvic ± paraaortic lymph-

adenectomy. We included patients with endometrial, ovarian, cervical cancer early stage and adnexal masses. Surgery time, blood requirements and various surgical parameters were compared. They resected parametrium, paracolpos and vaginal cuff using clamps and suture ligated them in 21 patients while 31 cases were done with a bipolar vessel sealing system. Ligasure group received lesser transfusions as compared to those operated with clamps (mean, 0.61 ± 1.1 vs. 2.14 ± 2.6 units, respectively; $P = 0.01$). The transfusion rate was 26% (8/31) and 67% (14/21) ($P < 0.05$) which is significantly different. Our patients did not require any transfusion. They did not find any difference in operating time (199 ± 33 vs. 213 ± 45 min, respectively) in both groups. Our mean operating time was135 min noted in TAH, BSO, B/L PLND, PALND and total omentectomy group. This was comparative to their ligasure group and much lesser than their conventional group. In their study no significant difference was found in postoperative stay and febrile morbidity. In their ligasure group, one patient developed a ureterovaginal fistula. We had postoperative retention of urine in one patient of type C radical hysterectomy which resolved in 3 months. In 2 patients left iliac fossa lymphocele developed (6.89%) which worsened to left leg DVT with hydroureteronephrosis in one of them. We did not have any fistulae.

Jackleen Ali Hussein et al [9] did a study "Sutureless total abdominal hysterectomy using marclamp "in 2020 wherein they compared total abdominal hysterectomy using marclamp and ligasure along with other suture ligature techniques. They included 47 patients with benign and malignant uterine and ovarian diseases. They excluded cervical cancer patients. We included proven uterine, cervical and ovarian malignancies alongwith suspicious adnexal masses. They did TAH using Marclamp and measured the operating time, blood loss, intraoperative and postoperative complications, hospital stay and histo-pathologic results. In their study mean operating time for TAH, TAH with BSO, TAH with BSO and infracolic omentectomy was 60 min, 75min and 83.8 min respectively. In our study MOT for TAH with BSO, TAH with BSO and PLND, TAH with BSO and PLND with total omentectomy was 53.33 min, 120 min, 113.125 min respectively. In their study blood loss for each of them was 64ml, 85ml and 103 ml. We had blood loss of 26.66,100, 60 ml respectively. Their mean hospital stay was 2 days. We had mean hospital stay of 4.6,6, 7.125 days respectively. As per our protocol, the patients were discharged after resumption of full oral diet. No intraoperative complications and mortality were seen in their study as well as ours. Postoperative complications were 10.63% in their study. We had post operative complications in 3(10.34%) patients. They concluded that the use of Marclamp IQ device in performance of total abdominal hysterectomy can reduce operative time, intraoperative blood loss, complication rates and the hospital stay. It also reduces cost of surgical sutures. Our study also shows vessel sealing device to be better over other conventional techniques.

Ilgin Turkcuoglu, et al [10] did a study "Tissue damage in abdominal hysterectomy performed with a vessel sealing system" in 2012 where they compared tissue damage, operation times, blood loss, short term postoperative complication rates and hospitalization durations of abdominal hysterectomies using ligasure vessel sealing system (LVSS) and conventional suture ligation. They included 31 cases in suture ligature group and 22 in ligasure group. Inclusion criteria were benign lesion of uterus and adnexa while patients with malignant conditions, tubo-ovarian abscess, comorbidities like DM, hypertension, RA, PID were excluded. Most of our patients were gynaecological malignances. We did not exclude patients with co morbidities. In our study diabetes was seen in 24% of patients while hypertension in 27.5%. Hypothyroidism was seen in 20%. Though obesity[11] is a common association, it was present in only 6.8 % of our patients. They performed a Richardson type hysterectomy with or without BSO via Pffanensteil incision and evaluated WBC count, CPK, CRP and hemoglobin levels 1 day before and 24 and 48 hours after the surgery. Their mean operating time was 92.1 ± 21.1min in suture group and 90.2 ± 20.6 in ligasure group. Blood loss was 142.3 ± 40.5 ml and 157.1 ± 89.1 ml respectively. Their hospital stay duration was 3.2 ± 1 and 3.6 ± 2.4 days. They found no difference in operation time, blood loss, postoperative complications, and hospitalization stay between the two groups and concluded that ligasure vessel sealing system is safe and leads to similar tissue damage as the conventional suture ligature technique in abdominal hysterectomy. We did not measure the tissue damage markers. We found vessel sealing device to be a better means for sutureless hysterectomy.

Conclusion

Vessel sealing device use during surgeries in gynaecological malignancies lessens operative timings, reduces blood loss. There are less postoperative complications and need for blood transfusions. Overall, it is

better than conventional suture ligation technique for hysterectomy. In our part of the world where patient is generally low socio-economic and number of cases are considerably more, this device helps in faster turnover and reduces cost.

Conflict of interest: None. **Disclaimer:** Nil.

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